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(71) Applicant
TI Glow-Worm Limited (United Kingdom),
Nottingham Road, Belper, Derbyshire DE5 1JT

(72) Inventors
Dennis Norman Brown,
Amarjeet Singh Kooner

(74) Agent and/or Address for Service
Abel & Imray,
Northumberland House, 303-306 High Holborn,
London WC1V 7LH

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(56) Documents cited

GB A 2081885	GB 0527472
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(58) Field of search
F4W

(54) Gas fires

(57) A live fuel effect gas fire has a bed (1) of simulated fuel supported above a combustion chamber (20) which communicates via a passage (16) through the bed with a space (21) above the bed. A gas burner (29) orientated to fire into the combustion chamber (20) produces flames with primary aeration limited to an extent sufficient to produce loose "lazy" flames which in conjunction with the arrangement and shaping of the fuel (4, 9, 17) on the bed (1) allow flames to extend through the bed in a changing semi-random manner to simulate closely the appearance of a real coal fire.

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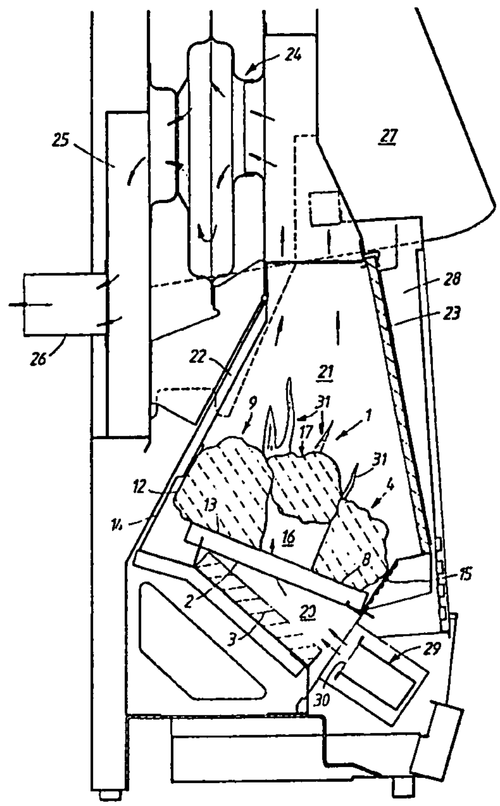

FIG. 1.

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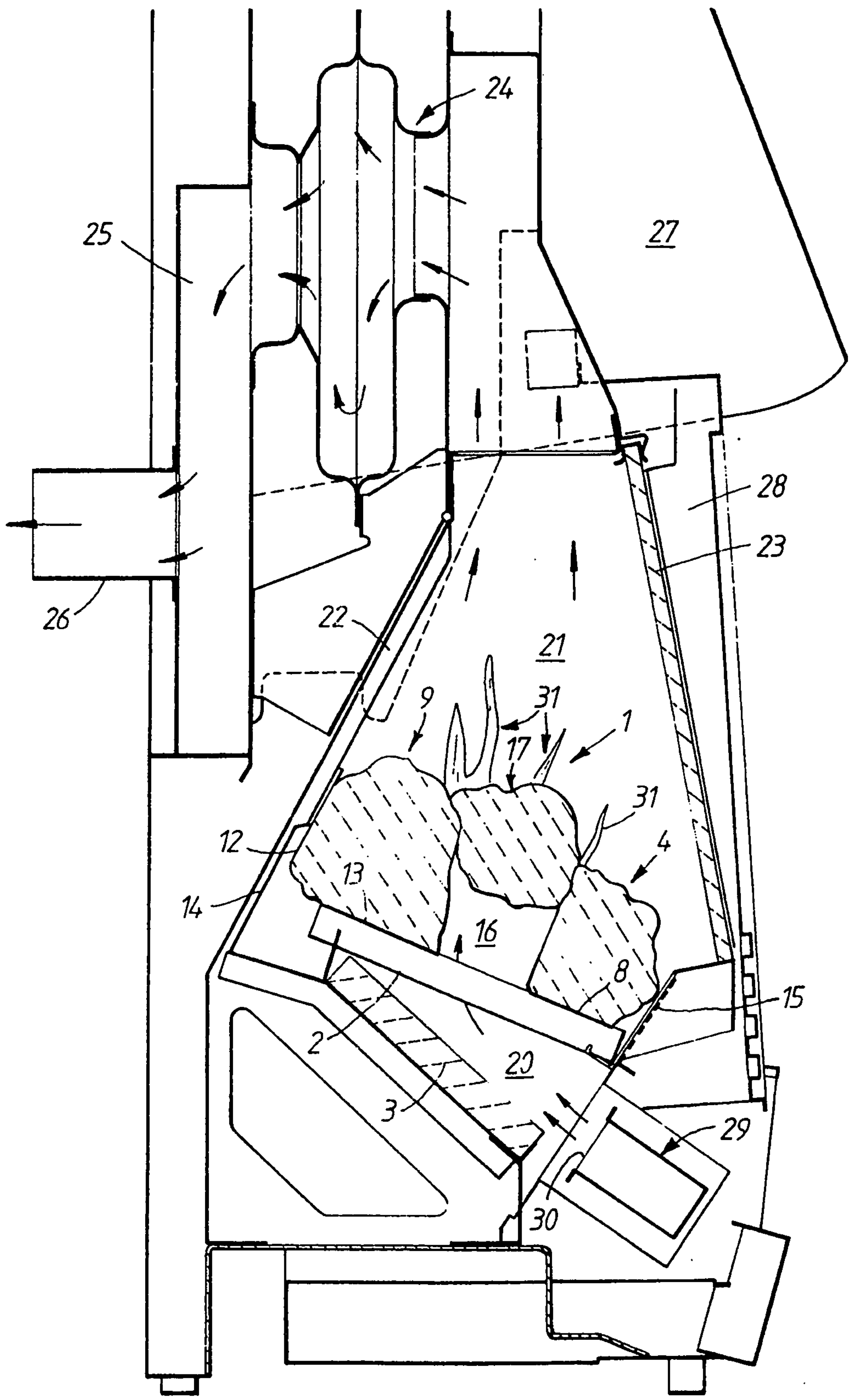

Fig. 1

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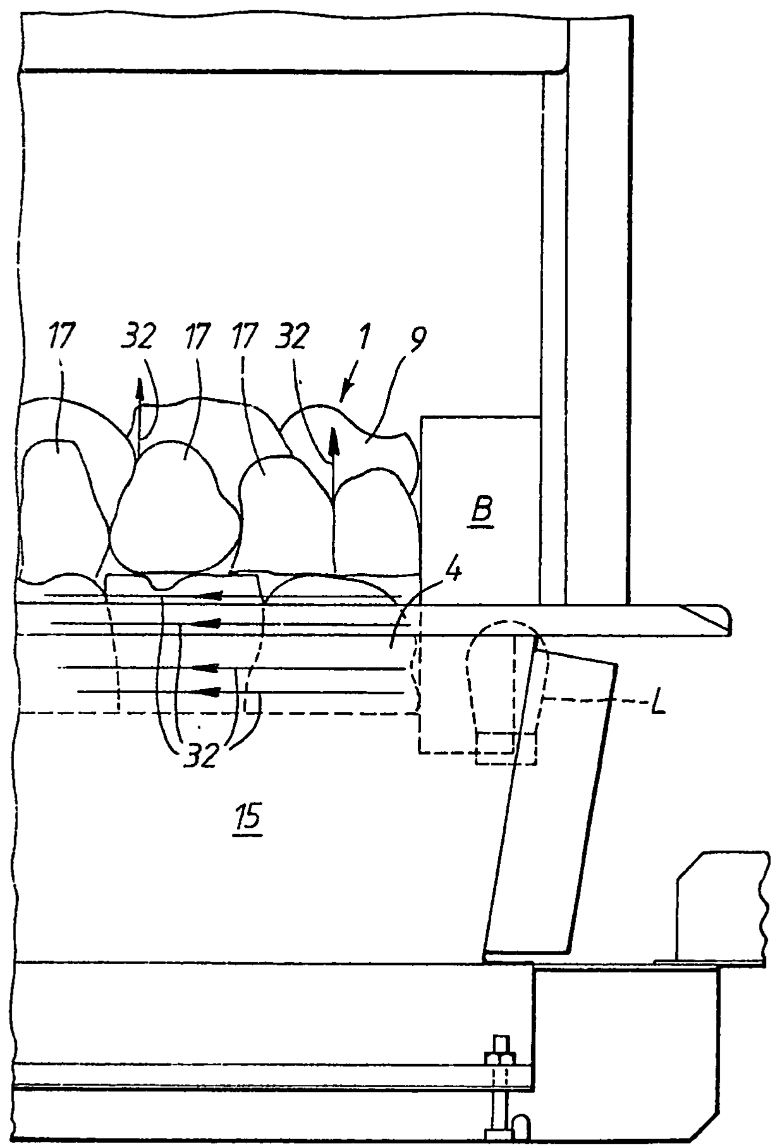

FIG.2.

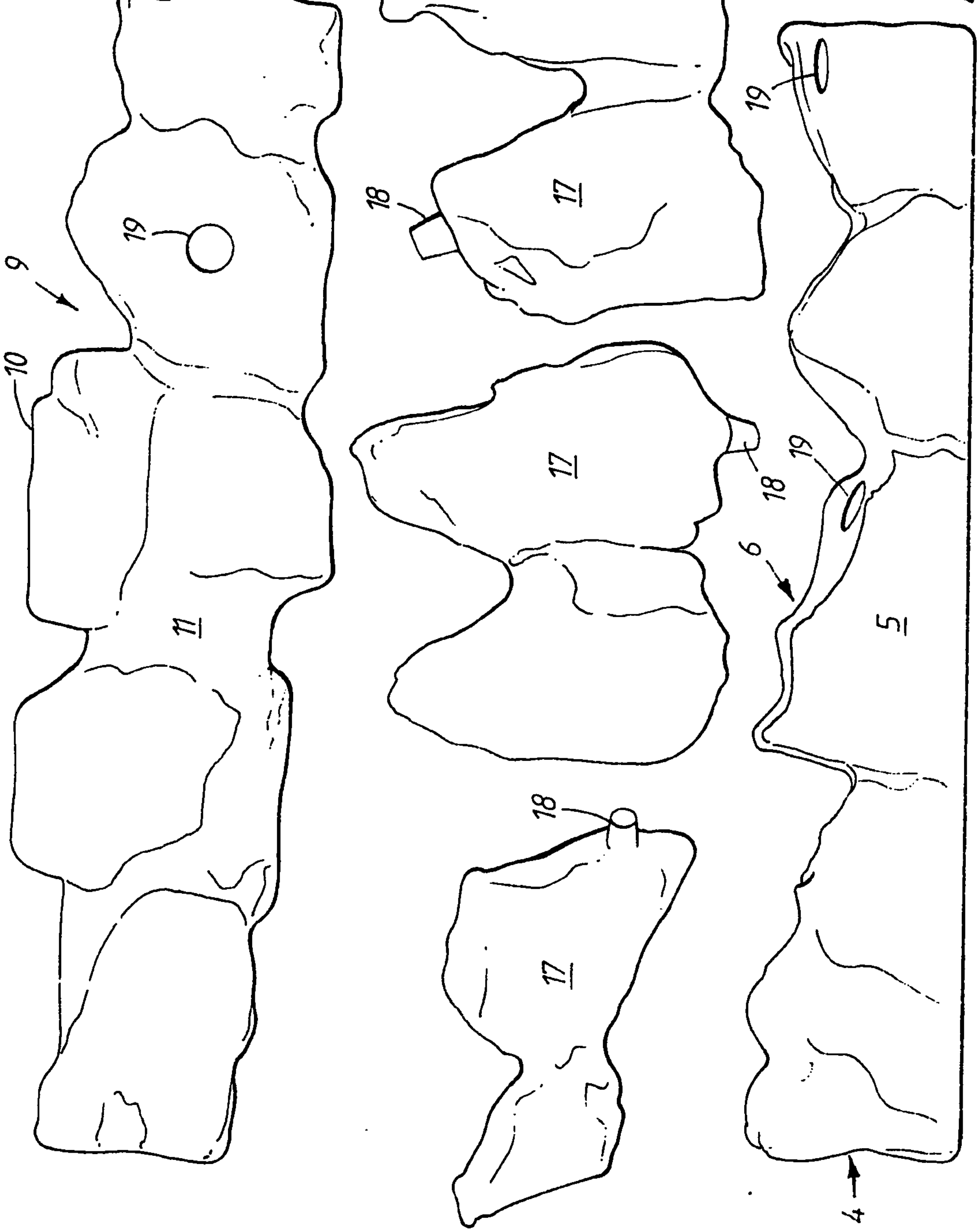

FIG. 3.

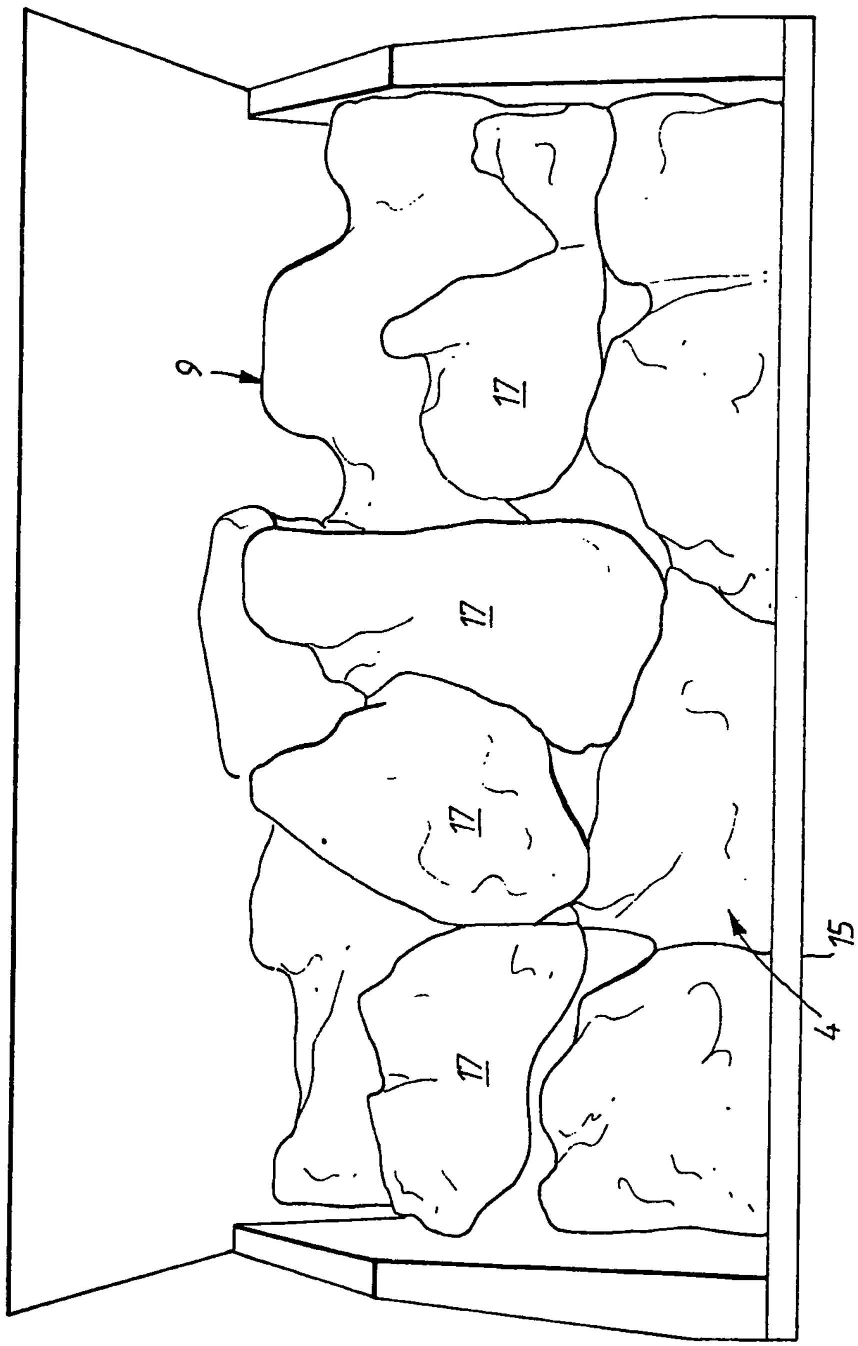

FIG. 4.

SPECIFICATION

Improvements in or relating to gas fires

This invention relates to gas fires and has particular reference to that class of gas fire known as live fuel effect gas fires.

Such fires comprise a bed of simulated fuel, for example simulated coal or logs or pine cones, which may be of a ceramic material readily heated to incandescence by a gas burner whose flames impinge on the bed from beneath.

To enhance the realism of the appearance of the fire, it is sometimes arranged for suitable gas flames to extend through the bed thereby creating the impression that such flames are the result of fuel combustion. It has been proposed to provide a second burner to provide such flames in addition to the gas burner provided to heat the fuel. It is found, however, that the flames of the second burner tend to assume fixed positions and lack the random movement of the flames of a real fire. Moreover, the provision of the second burner adds to the cost of the fire.

It is an object of the present invention to overcome the disadvantages just mentioned.

According to the present invention a live fuel effect gas fire has a bed of artificial fuel heatable by a gas burner firing into a space beneath the bed, the supply of primary air to the burner being restricted to an extent sufficient to produce "lazy" flames, and in which fuel forming the bed is so arranged as to allow some at least of the flames from the burner to pass therethrough.

The burner may have a group of burner ports or a series of spaced groups of burner ports, and in which the bed includes elements of fuel positioned to lie in the path of flames from the ports.

There may be a combustion chamber beneath the bed and into which the gas burner fires.

Preferably, the fuel on the bed is so arranged as to provide front and back rows of fuel spaced from one another by a passage communicating with the combustion chamber and with a space above the bed, the latter also comprising further fuel elements bridged across the passageway in a spaced manner.

Some at least of the further fuel elements are positioned to lie in the path of flames from the burner ports.

The combustion chamber may be bounded by an inclined floor of heat resistant material and by the lower surface of the bed.

By way of example only, a live fuel effect gas fire will now be described in greater detail with reference to the accompanying drawings of which:

Figure 1 is a vertical section centrally through the fire,

Figure 2 is a front elevation of part of the fire,

Figure 3 is a front elevation in exploded form of the components of a fuel bed, and

Figure 4 is a front elevation of the assembled components of the fuel bed.

The gas fire is of generally-conventional construction having a bed 1 of simulated fuel contoured and coloured to rese [illegible] supported upon ceramic rods 2 spaced across the side-to-side dimension of the bed. The rods 2 are supported by the internal structure of the fire above an inclined floor 3 of ceramic or ceramic-fibre material. The rods 2 lie in a plane inclined somewhat less steeply than the floor 3 and which meets the floor along the rear edge of the latter - the leaft-hand end as seen in Figure 1. However, other arrangements are possible.

The bed 1 comprises a front row 4 of unitary form and contoured to simulate the appearance of adjacent lumps of coal. Thus, the front face 5 of the row 4 and its upper surface 6 is irregular but the rear face 7 and the lower face 8 are substantially plane.

The bed also has a rear row 9 of unitary form also contoured to simulate the appearance of adjacent lumps of coal. The upper surface 10 of the rear row 9 is irregular as is the front surface 11. The rear surface 12 and the lower surface 13 are substantially plane.

The front and rear rows 4 and 9 thus seat in a stable manner on the rods 2 and are disposed between end firebricks B (Figure 2), a rear retaining wall 14 and a front retaining wall 15 that are part of the structure of the gas fire.

The rows 4 and 9 are spaced from one another by a passage 16 across which are bridged separate fuel elements 17. The elements 17 are arranged irregularly as indicated in Figure 4, there being gaps between both individual elements 17 and between the latter and the front and rear walls.

The elements 17 are also contoured to simulate lumps of coal and are secured to the rows 4 and 9 in some suitable manner, for example by providing the elements 17 with pegs 18 which locate in holes 19 in the rows 4, 9.

The rows 4 and 9 and the elements 17 are of ceramic material, ceramic fibre material or porous ceramic material, and are hollow, the material and the wall thickness being such that they will heat up rapidly and also cool down quickly.

Between the floor 3 and the lower faces 8 and 13 of the rows 4 and 9 is formed a combustion chamber 20, the passage 16 providing an outlet from the chamber to a space 21 above the bed 1 bounded at the rear by an inclined back wall 22 of the fire and a front panel 23 of transparent, heat resistant glass or other suitable transparent material. The back wall 22 may be reflective.

The space 21 is in communication with a heat exchanger 24 leading to a flue break 25 and an outlet flue 26. In Figure 1, the flow of combustion products is shown by the arrows.

Above the panel 23 is a canopy 27 supported between the side walls of the fire one of which is shown at 28.

The fuel is heated by a single gas burner 29 located across the front of the fire beneath the retaining wall 15 and inclined as shown so that it fires into the combustion space 20.

The burner 29 has a series of spaced groups of flame ports formed in its upper surface 30. The groups are linked by ignition ports in known manner. The burner has three such groups of ports and is arranged so that the supply of gaseous fuel to the [illegible] at to the outer

groups. The burner is aerated but the degree of primary aeration obtained by the well-known injector action is closely controlled and considerably limited as compared with a burner operating under normal, full primary aeration. Restriction of primary air is obtained by baffles which limit the entrainment of primary air. Such baffles may be in the form of tubes enclosing each injector.

Instead of the duplex type of burner just described, it is possible to use a simplex burner which could have either the spaced sets of ports or a single set.

The extent of the restriction of primary aeration is such as to produce longer, "lazy" flames resembling those of a non-aerated burner. The flames extend into the combustion chamber 20 and upwardly into and through the passage 16. In so doing, the flames impinge on the lower and inner surfaces of the fuel and bring to incandescence the shaded area. In addition, the flames also impinge on the rods 2 thereby raising these to incandescence.

The location of the separate elements 17 of the fuel bed is such that some at least of the elements lie directly in the path of flames from the burner, such flames thereby being deflected into spaces between the elements 17 and between the latter and the front and back rows 4 and 9 of fuel.

The front and back surfaces of the rows 4, 9 are arranged to fit closely the adjacent retaining walls 14, 15 so avoiding the formation of flame paths which may allow flames to impinge on panel 23 or the back wall 22. Such impingement may cause discolouration and/or 'sooting' of the panel and back wall.

The internal structure of the fire and the dimensions of the chamber 20 and the passage 16 ensure more than adequate secondary aeration of the burner flames. In that way combustion standards applicable to the fire are complied with.

The effect of the limitation of primary aeration together with dimensioning of the combustion chamber 20 and the passageway 16 and the arrangement and shaping of the fuel allow burner flames to pass through the fuel bed, as indicated at 31, in a somewhat random manner thereby simulating more closely the appearance of a real coal fire. The flames impinge on the lower surfaces of the fuel elements 17 in a somewhat random fashion because of the "lazy" nature of the flames and because of the irregular nature of the flow of combustion products through the bed and this contributes to the somewhat random movement of the flames. Such flame movement is assisted and enhanced by air flow movement within the space 21.

Surprisingly, the arrangement is found to permit the use of flames with considerably reduced primary aeration without producing, at the same time, the sooting that arises when such flames impinge upon a surface. This is thought to result at least in part from the balanced secondary aeration of the flames.

As is customary in such fires, flow of ambient air over the heat exchanger 24 cools the latter and provides a supply of convected heat to the space in the vicinity of the fire.

Although not shown in Figure 1, illumination means, for example electric lamps, may be provided for illuminating the combustion chamber 20. In this way, the 'cold', 'dead' look normally associated with live fuel effect fires when not in use is avoided. When the fire is not in use, the maps are energised to light the combustion chamber beneath the fuel bed thereby creating the impression of combustion. The effect is enhanced if the lamps are red or orange coloured. The lamps may also be energised when the fire is in use but their effect is less noticeable.

Conveniently, the end firebricks between which the fuel bed is positioned are apertured to allow light from lamps L (Figure 2) positioned externally of the end bricks to shine into the combustion chamber. The lamps are protected by panels of transparent heat resistant material in the apertures. The light rays from the lamps are shown at 32 in Figure 2.

Alternatively, the bed may be illuminated from above and/or the sides in the manner described in co-pending Patent Application No.8402875 (Case TIG 130).

Further means may be provided for importing a "flicker" to the illumination as is described in the Patent Application just referred to.

CLAIMS

1. A live fuel effect gas fire having a bed of artificial fuel heatable by a gas burner firing into a space beneath the bed, the supply of primary air to the burner being restricted to an extent sufficient ot produce "lazy" flames, and in which fuel forming the bed is so contoured and arranged as to allow some at least of the flames from the burner to pass therethrough.

2. A gas fire as claimed in claim 1 in which the burner has a group of burner ports or a series of spaced groups of burner ports, and in which the bed includes spaced elements of fuel positioned to lie in the path of flames from the ports.

3. A gas fire as claimed in claim 1 in which there is a combustion chamber beneath the bed and into which the gas burner fires.

4. A gas fire as claimed in claim 3 in which the fuel on the bed is so arranged as to provide front and back rows of fuel spaced from one another by a passage communicating with the combustion chamber and with a space above the bed, the latter also comprising further fuel elements bridged across the passageway in a spaced manner.

5. A gas fire as claimed in claim 4 in which some at least of the further fuel elements are positioned to lie in the path of flames from the burner ports.

6. A gas fire as claimed in any one of claims 3, 4 or 5 in which the combustion chamber is bounded at least in part by an inclined floor of heat resistant material and by the lower surface of the bed.

7. A gas fire as claimed in claim 6 in which the lower surface lies in a plane inclined relatively to that containing the floor.

8. A gas fire as claimed in any one of the preceding claims in which the bed is supported upon a series of spaced supports of heat resistant material.

9. A gas fire as claimed in any one of the preceding claims in which means are provided for

illuminating the bed.

10. A gas fire as claimed in claim 9 in which the illumination means illuminate the bed from above and/or below and/or one or both sides.

11. A gas fire as claimed in any one of claims 1-8 and including means for illuminating the bed from below in such manner as to create a visual impression of combusting fuel.

12. A gas fire as claimed in any one of claims 3-8 in which means are provided for illuminating the combustion chamber in such manner as to create a visual impression of combusting fuel.

13. A gas fire substantially as herein described with reference to and as illustrated by the accompanying drawings.

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